

UTILIZING URBAN SPACE FOR BETTER TRAFFIC MANAGEMENT- A STUDY OF KHULNA CENTRAL BUSINESS DISTRICT, BANGLADESH

Khan Rubayet RAHAMAN¹, Md. Zakir HOSSAIN²

¹ Khulna University, Khulna 9208, Bangladesh, krrporag@gmail.com

² Khulna University, Khulna 9208, Bangladesh, zakir_urp9913@yahoo.com

Abstract

A city center or central business district (CBD) is the heart of a city. As a large number of people and business concentrates there for different purposes it deserves special consideration from city planning. Most crucial problem of CBD is that much development blurs beside the streets and it disrupts circulation and communication. The CBD area of Khulna already coped up with this problem. In the Khulna CBD area also faces this sort of traffic problems and to minimize these traffic problems, utilization effectively of urban space through different design considerations is required. This paper also tries to develop layout plan focusing the maximum utilization of the urban space, considered different design criteria and it can be used as a tool to reduce the traffic problems of the CBD area. Various street problems are identified which are responsible for the inefficient circulation system of the study area. It is also identified that street problems are related with design elements. As in the study area, the conditions of urban design elements are poor they can not ensure proper canalizations both for pedestrian and vehicular traffic. In the time of urban design element analysis focus has been given on the street management respect. The proposals included in this research paper will be helpful for improvement of the present level of function as well as can be used to develop development control rules.

Keywords: Urban space, Traffic Management & Central Business District (CBD).

1. Introduction

Developing countries like Bangladesh, city streets fail to function at its satisfactory level. A well transportation circulation system is very much important for every country and its rapid growth of economic, industrial, trade etc. The efficiency of an urban transport system is greatly influenced by its circulation management system, Circulation management is very important for efficient functioning of road transport (Bently, 2001). The urban transportation problem is actually a complex bundle of interrelated problems (Dimitrion, H., 1992). They can be grouped in three categories: congestion, mobility, and ancillary impacts. Traffic congestion, delays, noisy and unpleasant traffic way, anxiety for road accident, inaccessible and unpleasant pedestrian ways, these are common problems for every streets (Gallion, A, 1998). During the rainy season water logging is additional sufferings for the traffic.

Roads in Khulna city are not free from these problems. Central Business District area is an important part of the city because different types of activities such as commercial, administrative, public, religious, recreation and residential have been developed based on CBD (Hossain, 2002). DakBangla and adjacent areas are considered as the main CBD area of Khulna city. To cope with the future growth and development of the city and subsequent expanding trade and commerce and growth of population, there is a need to develop an efficient circulation system in the CBD of Khulna city. Within the main city, the traffic flow has not been found uniform in all intersections of streets. Most of the roads are narrow. Traffic congestion occurs mainly in DakBangla intersection, Picture palace intersection, intersection point between Clay road and Old Jessore road, intersection point between Boro Bazer and K.D Ghosh road, intersection point between Cemetery road and Dhormoshava road, intersection point between Sir Iqbal road and K.D Ghosh road etc. in CBD area of Khulna city. Congestions are found to be occurred mainly by slow moving traffic, like Rickshaws and improper traffic management at intersections. Thus vehicular traffic stops at these intersections and cannot choose their desire path directly in a systematic way. To ensure efficient circulation pattern is a critical dilemma of modern urban transport management. By arranging the traffic path in a systematic way, smooth movement of vehicular traffic is possible. On the other hand it will help to reduce the rate of traffic accident, conflicting turning movements. So, efficient circulation management is required in CBD area of Khulna city. To increase the capacity and to insure condition for smooth traffic movement immediate attention is required for the streets. This paper also finds out the existing deficiencies of the traffic management system. Then, prepare a layout plan considering maximum utilization of the space of CBD area through different design considerations.

2. OBJECTIVES

- a) To study the existing condition of urban space and utilization for traffic management and safety
- b) To give a better layout plan so that the existing condition can be combated

3. METHODOLOGY

Based on primary data and visual survey, this paper tries to identify the problem in detail about the circulation pattern of one of the major cities in Bangladesh with a population of almost 3.5 million. The Central Business District (CBD) area is the heart of the economy and congestion happens all the time during the and up to midnight. In this regard, counting the traffic volume in three different times, visualizing the problems supported by video and photographs and interviewing the stakeholders to know the extent of the problems were being carried out as a means of method adopted for this research

(Gibberd, F, 1996). Maps and visual figures have been developed based on photographs and visual survey in the study area too. After putting the problems into the maps and graphics, the stakeholders have again being asked to put their choice which might be best suited for them in Khulna city. Some socio-economic parameters have been considered too but did not bring into the paper. At the end, the recommendations have been cited which is more realistic after careful revision and discussions with the professionals and stakeholders.

4. FINDINGS AND ANALYSIS

Land use & Activity Pattern of the Area

Land use distribution means the amounts of land occupied by various types of activities in different block. For the purpose of land use distribution analysis, the land use of the CBD of Khulna city has categorized into commercial, residential, educational, recreational, religious, offices and health services. The present uses are found to be commerce oriented in all the blocks. In PPB and RMB, there are more varieties in land uses than other two (Hasan, 2001). The HBB comprises the least variety of land uses where there are only commercial and administrative land uses.

TABLE I - LAND USE DISTRIBUTION IN GROUND FLOOR IN DIFFERENT BLOCK OF CBD

Land use categories	Nixon Market block (NMB)		Picture Palace block (PPB)		Hooglee Bakery block (HBB)		Railway market block (RMB)	
	Area in acre	%	Area in acre	%	Area in acre	%	Area in acre	%
Commercial	2.2	63.40	2.48	74.70	0.27	77.14	2.32	80.56
Residential	0	0	0.16	4.82	0	0	0.04	1.39
Office	0.73	21.04	0.36	10.84	0.05	14.29	0	0
Educational	0	0	0	0	0	0	0.2	6.94
Religious	0	0	0	0	0	0	0.01	0.35
Health services	0.34	9.80	0	0	0	0	0	0
Recreational	0	0	0.24	7.23	0	0	0	0
Others	0.2	5.76	0.08	2.41	0.03	8.57	0.31	10.76
Total	3.47	100	3.32	100.00	0.35	100	2.88	100

Source: Field survey June, 2007

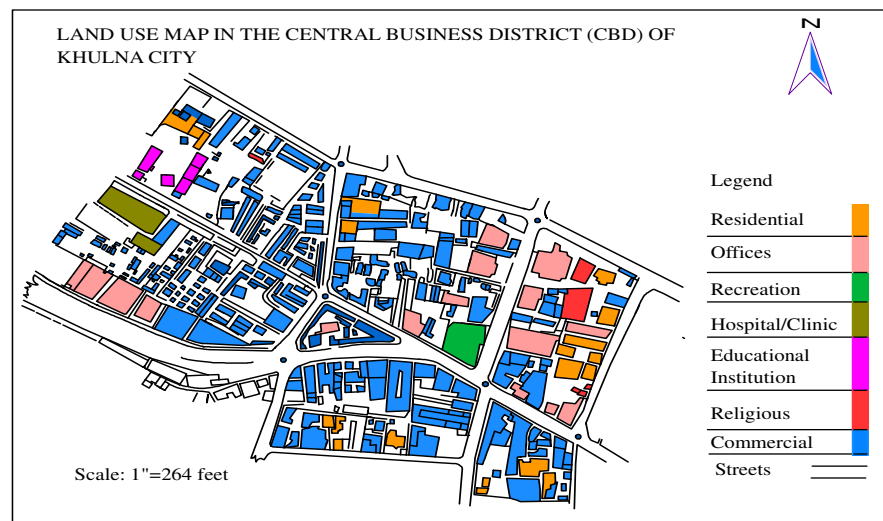


FIGURE 1 - LANDUSE MAP OF CBD IN KHULNA

Circulation in the CBD of Khulna city

The circulation Pattern is one of the most powerful tools to control activity patterns, movement patterns of pedestrian and vehicles (Cruces, 1988). Circulation includes vehicular and pedestrian traffic flow on road and pedestrian way, their access to road, their mobility through road and the factor influences their flow. The main goal of the study is to know the existing circulation pattern of the study area by the analysis of access of traffic in this area, their flow, mobility and their flow effecting factors, Problems they fetch. Circulation of various streets is influenced by active carriage width, parking facilities, on street parking, vehicle speed, signage, Road light and road marks, traffic signal and so many things (Goodman, 1968).

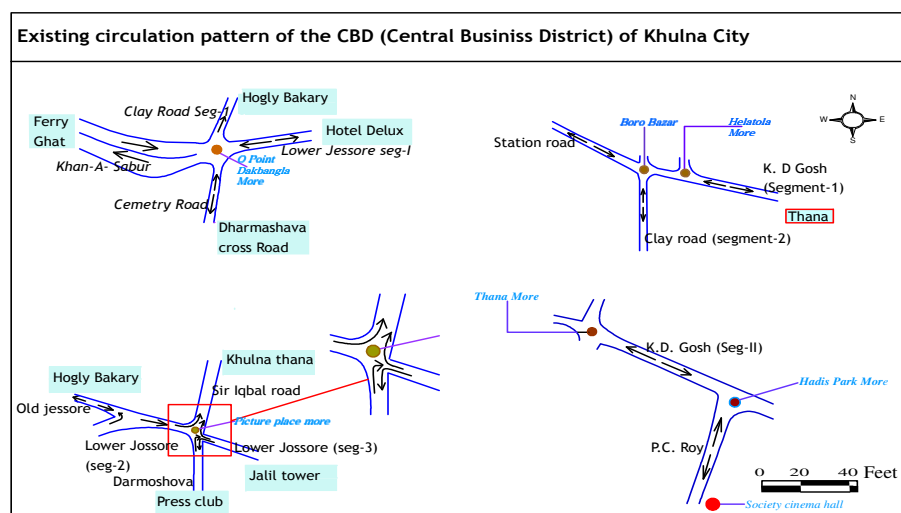
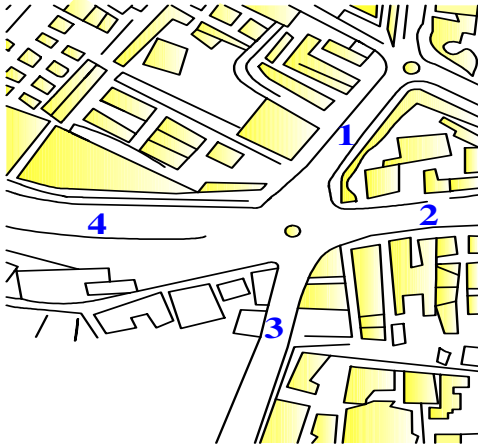


FIGURE 2 - EXISTING CIRCULATION PATTERN OF KHULNA CBD AREA.

Existing problems of different junctions

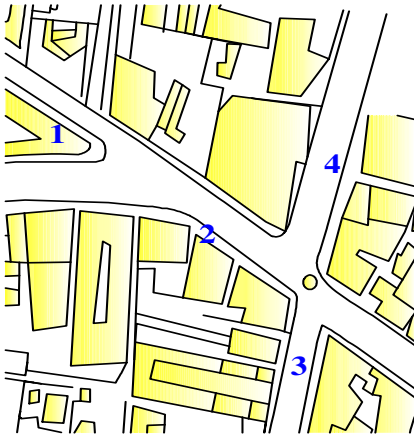


Road id

1. Clay Road
2. Lower Jessore Road Seg-1
3. Cemetery Road
4. Khan-A- Sabur Road

Problems at Dakbangla intersection

- On street parking at the road edge
- On footpath parking
- Water logging at the road edge
- Informal business on foot path
- Business materials on footpath
- Construction material on footpath
- Business materials on carriage way
- Construction material on carriage way
- Sign on footpath
- Electric pool on footpath
- Absence of footpath
- Inadequate road crossing facilities



Road id

1. Old jessore
2. Lower Jessore Road Seg-2
3. Dharmoshava road
4. Sir Iqbal road

Problems at Picture place intersection

- On street parking at the road edge
- On footpath parking
- Ramp breaking
- Informal business on foot path
- Construction material on footpath
- Business materials on carriage way
- Construction material on carriage way
- Sign on footpath
- Electric pool on footpath
- Inadequate road crossing facilities



Road id

1. Station Road
2. K-D-Gosh Road-Seg-1
3. Clay Road-segment-3



Road id

1. Sir Iqbal Road
2. K. D. Gosh Road

Problems at Borobazar intersection

- On street parking at the road edge
- On footpath parking
- Water logging at the road edge
- Informal business on foot path
- Business materials on footpath
- Construction material on footpath
- Business materials on carriage way
- Construction material on carriage way
- Sign on footpath
- Electric pool on footpath
- Absence of footpath

Problems at Society cinema intersection

- On street parking at the road edge
- On footpath parking
- Water logging at the road edge
- Construction material on footpath
- Sign on footpath
- Inadequate road crossing facilities

After reviewing the problems in detail, some necessary measures are being cited in this study. The strategies have been considered after reviewing carefully and discussing with the professionals and the stakeholders.

5. RECOMMENDATIONS

After analyzing the existing problems and the data received from the field, it has been highly emphasized that the design and some immediate enforcement should be prioritized to combat the traffic congestion in the central business district of Khulna city. The Master plan of Khulna Development

Authority and the municipality plan of Khulna city also recommend the likely solutions to combat the need of enforcement in some major intersections. However, parking policies are also important part to combat the problems which are followed in the recommendations in this section.

a) Image enhancement

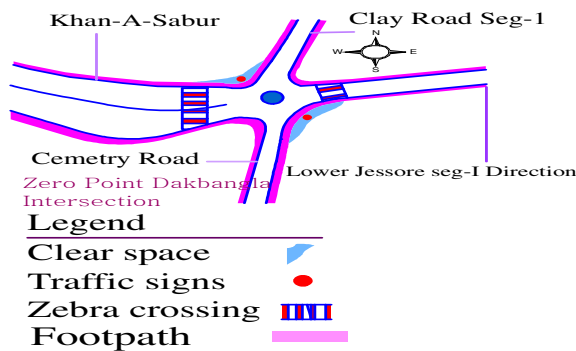
CBD possess several qualities which can leave a lasting impression on a first time visitor. These qualities include, but are not necessarily limited to, cleanliness, an orderly appearance, diversity, aesthetics, and the community's overall setting (Black, 1981). This section of meant to support a positive image of the CBD.

1. An emphasis on the use of landscaping materials especially when used in medians,
2. Street signs and other directional signs should be large and easy to read allowing the traveler to distinguish these major routes from all others.
3. Visual clutter may be mitigated through the management of the number, size, height, and appearance of signs.
4. An improvement of CBDs visual quality should be attempted by reducing trash/debris, and dust.
5. Encourage the use of matching, traffic signals, street lights and directional signs to provide a coordinated approach to design thus helping to avoid visual clutter.
6. A City-wide lighting ordinance should be developed which may require: Light standards which are chosen to be integral in size, form, and color in terms of the characteristics and use of the street with the district's character.
7. Promote unified street tree planting along street frontages to provide shade and visual relief. Such trees should be of a drought tolerant variety and of a variety that does not create damage to sidewalk and curbing. Landscaping techniques, trees for example, should be employed along the periphery of the walled area for visual relief.
8. Both new development and redevelopment, should be required to respect the architectural styles, bulk, setbacks, color, scale, character and site design relationships
9. Our natural surroundings are picturesque and serene. CBD of Khulna city intends to protect and preserve the characteristics that make our city and community unique and memorable. In this document, conservation addresses nonrenewable natural resources such as: open

space, natural landscaping, as well as historical and cultural resources. For Advocate an appropriate balance between physical development and open space that will provide a desirable environment and quality of life it is required Preserve Hadis-park.

b) Improving existing Junction condition

Works/Suggestions for Dakbangla Intersection



Node Reinforcing

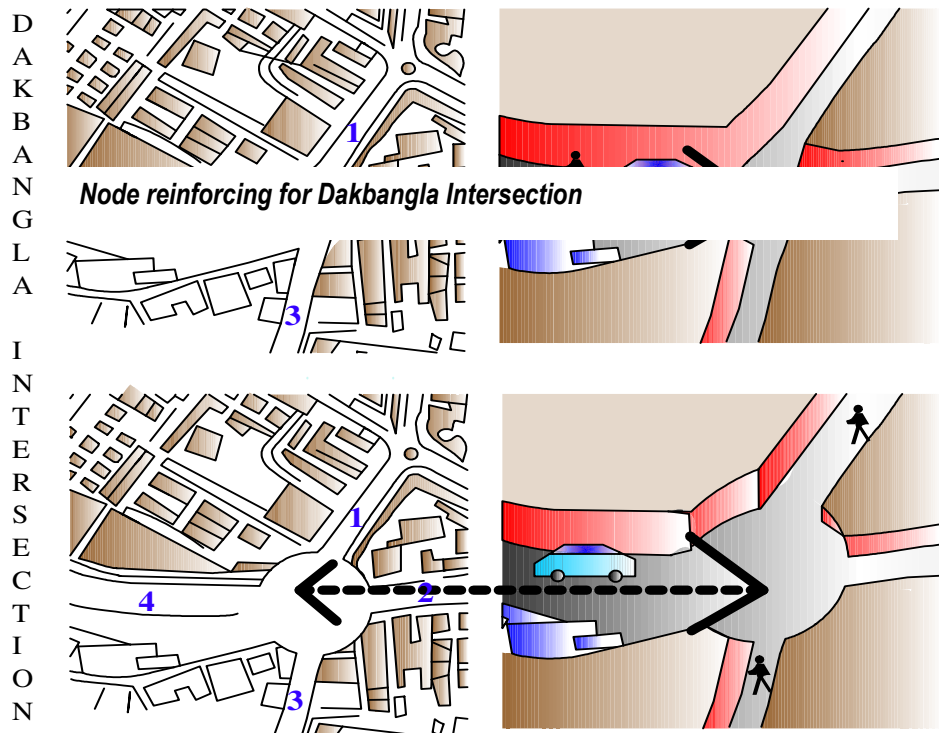
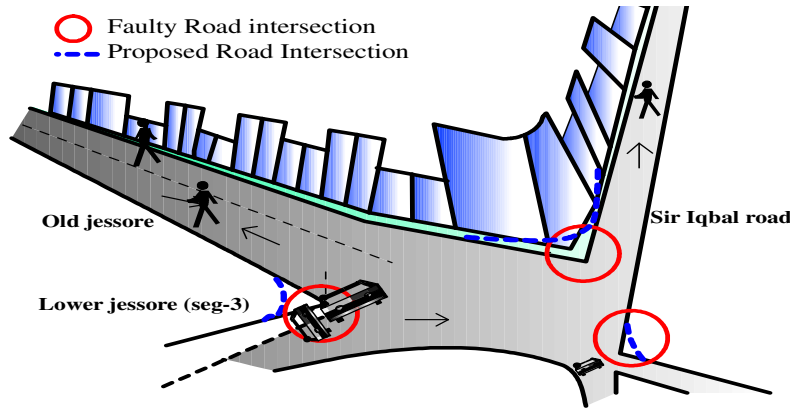


FIGURE 3 - EXISTING JUNCTIONS OF ROADS (ALSO CALLED NODES IN HERE) IN CBD AREA.

Works/Suggestions for faulty Intersection



Picture Place Intersection

FIGURE 4 - RECOMMENDATIONS IN SOME FAULTY INTERSECTIONS.

c) Taking new parking policies

Considering parking demand of the surrounding uses and parking demand of CBD, parking stand should be introduced. Future projected parking demand should be considered. Suitable site for parking has been shown in map (Open spaces and low land of Bangladesh railway) and on street parking provision also given in the map.

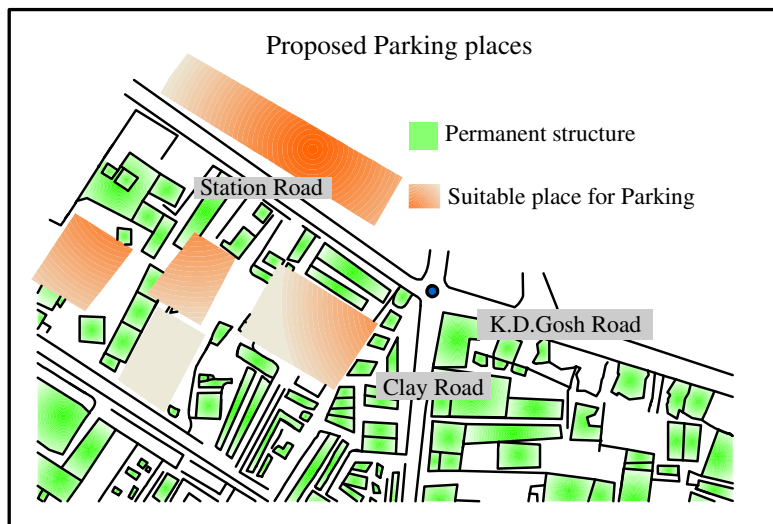
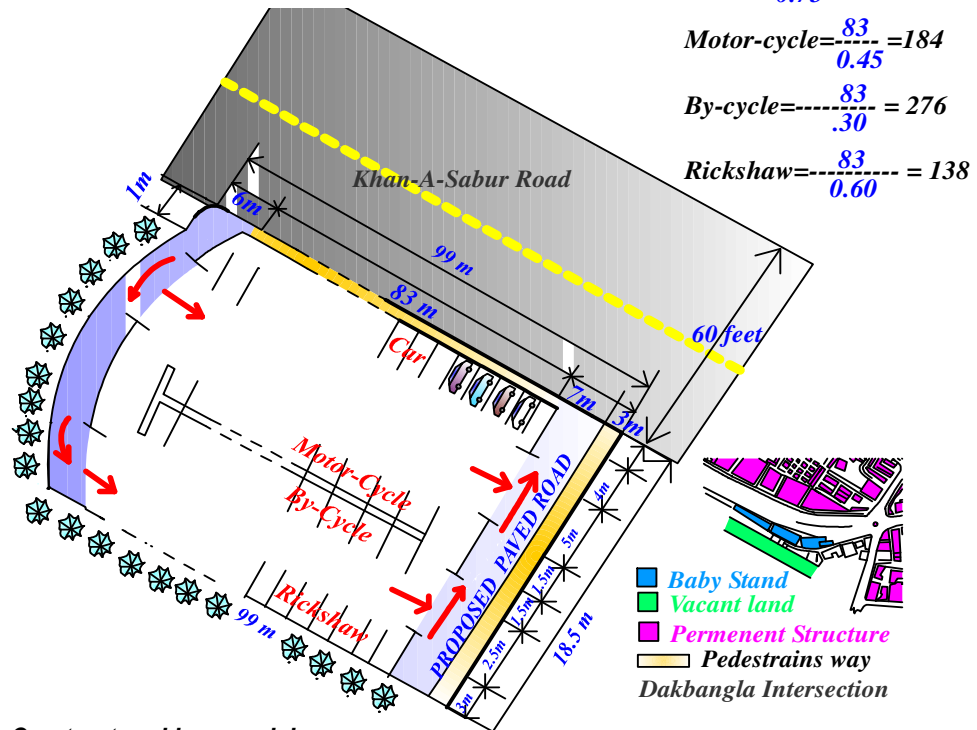


FIGURE 5 - PROPOSED PARKING STRATEGIES IN CBD AREA.

Parking lot design



On street parking provision

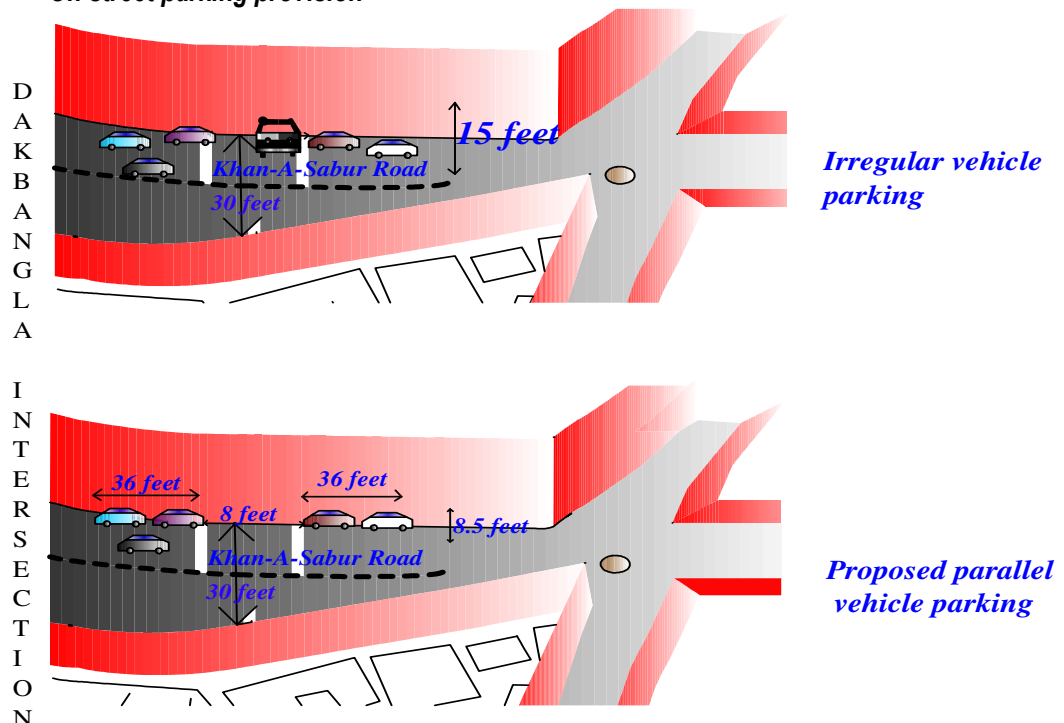


FIGURE 6 - PARKING LOT DESIGN CONSIDERATIONS IN DETAIL.

d) Improving Pedestrian ways and providing pedestrian circulation layout

Proposal for Road side building and occupancy control

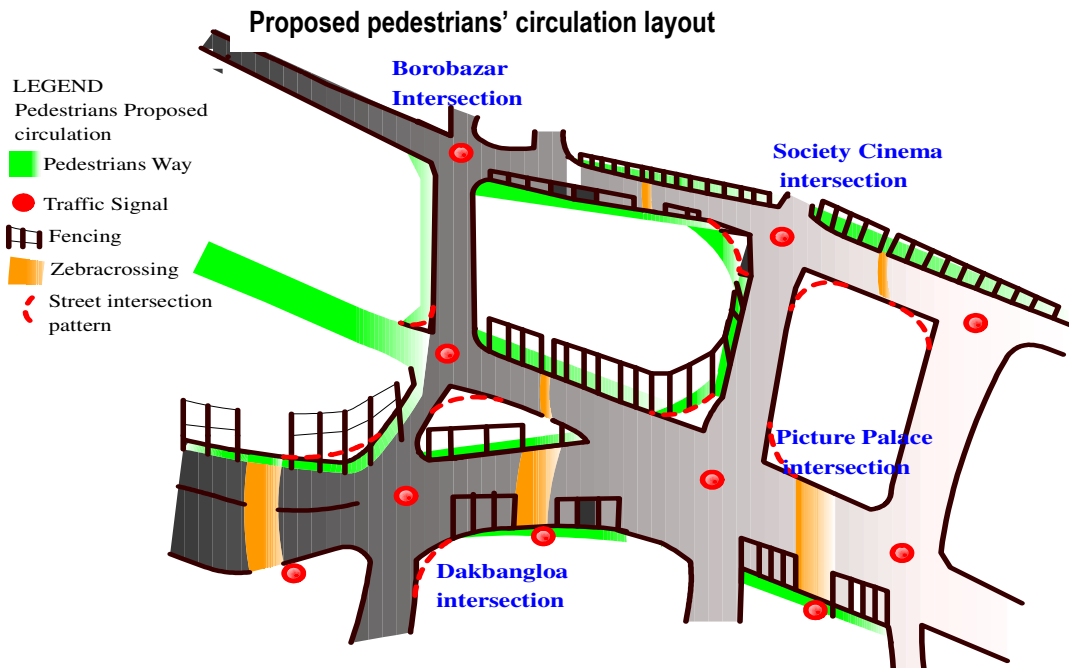
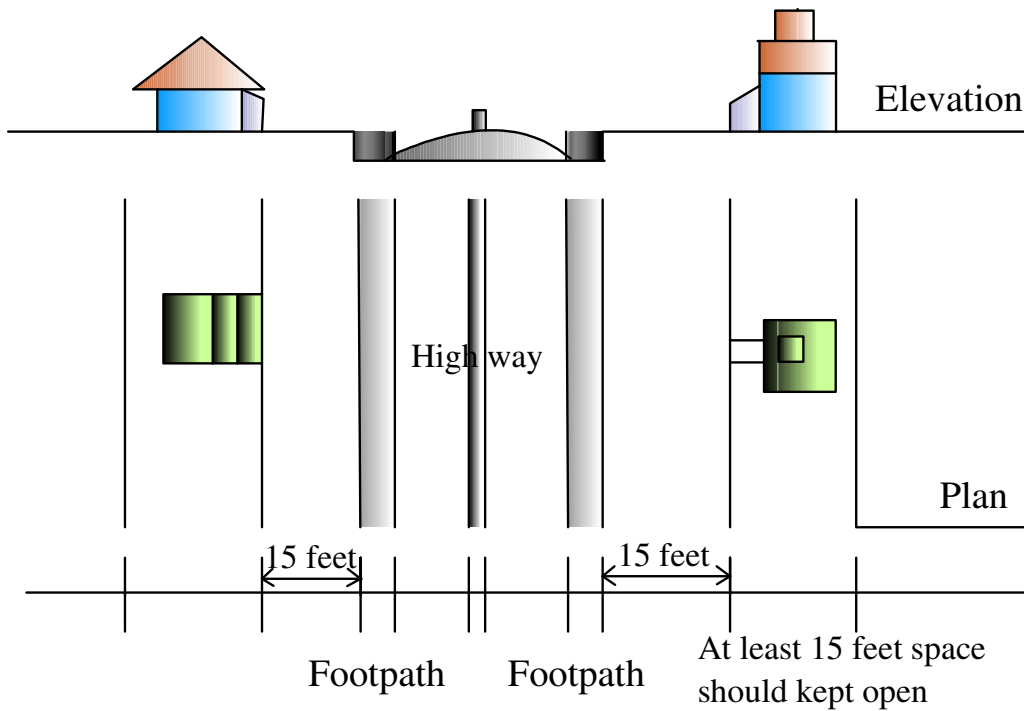


FIGURE 7 - ENFORCEMENT OF BUILDING STRUCTURES AND FOR BETTER PEDESTRIAN MOVEMENT.

e) Increment of Permeability

- a) Control on street parking along road edge.
- b) To offer garbage bins
- c) To develop design of outlet
- d) To control the heavy traffic generating roadside uses
- e) To design road entrance and to manage traffic movement at junction by design are must.
- f) To clear space at turning edge of junctions.
- g) Provision of streetlight on footpath and maintenance of existing light will have to be ensured.
- h) Surface treatment of pedestrian ways is the *crying need for pedestrians*.

f) Being Legible the site through the following measures

- a) By large sign and traffic signal, intersections should make legible.
- b) Junction indicating sign should be installed to make each link road legible to its user.
- c) By speed control sign drivers will get information; at this road what vehicle speed should be kept.
- d) Carriage width should be improved to make Dakbangla Intersection more legible to the drivers.

6. CONCLUSIONS

Still people of Bangladesh are not aware about their responsibility on roadway. Most of them are not habituated with modern traffic signs, signal and traffic management approach. It is necessary to guide their attitude by design control. In CBD Ineffective traffic management system, excessive vehicular flow, excessive pedestrians flow, excessive delay time, collusion, excessive Informal business activities on footpath, excessive Informal business activities on carriage way, excessive unauthorized on street parking, Low active carriage width, inadequate off street Parking facilities, inadequate and indistinct signage are the most common phenomenon in the daily life. This phenomenon's indicates bad circulation system. Can't we change this situation by our foresightedness, careful planning & execution to make the CBD livable again? Urban design intervention will be effective for them. This study ended with the realization that urban design consideration can be included in planning practice of Bangladesh.

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